

What is claimed is:

1. A method of providing clear channel access on a network, the method comprising:
 - a) receiving a communication signal from a remote network element, said communication signal comprising a previous transport overhead (PTOH) portion indicative of transport overhead contents of said communication signal prior to arrival at said remote network element, and a previous path error (PPE) portion indicative of path errors present in said communication signal at said remote network element; and
 - b) modifying a transport overhead portion of said communication signal in response to said PTOH and PPE portions.
2. The method of claim 1 wherein modifying comprises calculating a difference between path errors present in said communication signal, and said path errors present in said communication signal at said remote network element.
3. The method of claim 1 wherein said communication signal comprises a plurality of component signals and wherein modifying comprises calculating, for each of said component signals, a difference between path errors present in said component signal and path errors present in said component signal at said remote network element.
4. The method of claim 3 wherein modifying further comprises calculating a sum of said differences of each of said component signals.
5. The method of claim 4 wherein modifying further comprises adding said sum of said differences to at least some contents of said PTOH portion.

6. The method of claim 4 wherein modifying further comprises adjusting said transport overhead portion in response to a sum of at least some contents of said PTOH portion plus said sum of said differences.
7. An apparatus for providing clear channel access on a network, the apparatus comprising:
- a) a receiver operable to receive a communication signal from a remote network element, said communication signal comprising a previous transport overhead (PTOH) portion indicative of transport overhead contents of said communication signal prior to arrival at said remote network element, and a previous path error (PPE) portion indicative of path errors present in said communication signal at said remote network element; and
 - b) a processor circuit in communication with said receiver and configured to modify a transport overhead portion of said communication signal in response to said PTOH and PPE portions.
8. The apparatus of claim 7 wherein said processor circuit is configured to calculate a difference between path errors present in said communication signal, and said path errors present in said communication signal at said remote network element.
9. The apparatus of claim 7 wherein said communication signal comprises a plurality of component signals, and wherein said processor circuit is configured to calculate, for each of said component signals, a difference between path errors present in said component signal and path errors present in said component signal at said remote network element.
10. The apparatus of claim 9 wherein said processor circuit is configured to calculate a sum of said differences of each of said component signals.

11. The apparatus of claim 10 wherein said processor circuit is configured to add said sum of said differences to at least some contents of said PTOH portion.

12. The apparatus of claim 10 wherein said processor circuit is configured to adjust said transport overhead portion in response to a sum of at least some contents of said PTOH portion plus said sum of said differences.

13. An apparatus for providing clear channel access on a network, the apparatus comprising:

- a) means for receiving a communication signal from a remote network element, said communication signal comprising a previous transport overhead (PTOH) portion indicative of transport overhead contents of said communication signal prior to arrival at said remote network element, and a previous path error (PPE) portion indicative of path errors present in said communication signal at said remote network element; and
- b) means for modifying a transport overhead portion of said communication signal in response to said PTOH and PPE portions.

14. A computer-readable medium for providing codes for directing a processor circuit to modify a transport overhead portion of a communication signal received from a network element, in response to a previous transport overhead (PTOH) portion of said communication signal indicative of transport overhead contents of said communication signal prior to arrival at said remote network element, and a previous path error (PPE) portion of said communication signal indicative of path errors present in said communication signal at said remote network element.

- 5 **15.** A signal embodied in a carrier wave, the signal comprising code segments for directing a processor circuit to modify a transport overhead portion of a communication signal received from a network element, in response to a previous transport overhead (PTOH) portion of said communication signal indicative of transport overhead contents of said communication signal prior to arrival at said remote network element, and a previous path error (PPE) portion of said communication signal indicative of path errors present in said communication signal at said remote network element.
- 10 **16.** A method of providing clear channel access on a network, the method comprising:
- 15 a) inserting into a communication signal received at a network element, a previous transport overhead (PTOH) portion indicative of transport overhead contents of said communication signal prior to arrival at said network element, and a previous path error (PPE) portion indicative of path errors present in said communication signal at said network element; and
- 20 b) transmitting said communication signal to a remote device.
- 20 **17.** The method of claim **16** wherein inserting said PPE portion comprises calculating said PPE portion in response to path parity errors present in said communication signal at said network element.
- 25 **18.** The method of claim **16** wherein inserting said PPE portion comprises inserting said PPE portion into a path overhead portion of said communication signal.
- 25 **19.** The method of claim **18** wherein inserting said PPE portion further comprises adjusting a path parity error portion of said communication signal to compensate for insertion of said PPE portion into said path overhead portion.

20. The method of claim **18** wherein inserting said PPE portion comprises inserting said PPE portion into an unused portion of said path overhead portion.
- 5 21. The method of claim **18** wherein inserting said PPE portion comprises inserting said PPE portion into at least one of a **Z3** and a **Z4** byte of a Synchronous Optical NETwork (SONET) path overhead portion.
22. The method of claim **16** wherein inserting said PTOH portion comprises inserting said PTOH portion into a transport overhead portion of said communication signal.
- 10 23. The method of claim **22** wherein inserting said PTOH portion comprises inserting said PTOH portion into an unused portion of said transport overhead portion.
24. The method of claim **22** wherein inserting said PTOH portion comprises inserting said PTOH portion into an unused time-slot of said transport overhead portion.
- 15 25. The method of claim **16** further comprising calculating said PTOH portion in response to said transport overhead contents of said communication signal prior to arrival at said network element.
- 20 26. The method of claim **25** wherein calculating comprises counting a number of transport parity errors present in said communication signal prior to arrival at said network element.
- 25 27. The method of claim **26** wherein calculating comprises setting said PTOH portion equal to said counted number of transport parity errors present in said communication signal prior to arrival at said network element.
28. The method of claim **26** wherein calculating comprises setting said PTOH portion equal to an index value indicative of said counted

number of transport parity errors present in said communication signal prior to arrival at said network element.

5 **29.** The method of claim **16** further comprising inserting a PTOH header value in said communication signal preceding said PTOH portion, to identify said PTOH portion.

30. The method of claim **16** further comprising:

a) receiving said communication signal at said remote device, said communication signal comprising said PTOH portion and said PPE portion; and

10 b) modifying a transport overhead portion of said communication signal in response to said PTOH and PPE portions.

31. An apparatus for providing clear channel access on a network, the apparatus comprising:

15 a) a processor circuit configured to insert into a communication signal received at a network element, a previous transport overhead (PTOH) portion indicative of transport overhead contents of said communication signal prior to arrival at said network element, and a previous path error (PPE) portion indicative of path errors present in said communication signal at
20 said network element; and

b) a transmitter in communication with said processor circuit and operable to transmit said communication signal to a remote device.

25 **32.** The apparatus of claim **31** wherein said processor circuit is configured to calculate said PPE portion in response to path parity errors present in said communication signal at said network element.

- 5 **33.** The apparatus of claim **31** wherein said processor circuit is configured to insert said PPE portion into a path overhead portion of said communication signal.
- 10 **34.** The apparatus of claim **33** wherein said processor circuit is configured to adjust a path parity error portion of said communication signal to compensate for insertion of said PPE portion into said path overhead portion.
- 15 **35.** The apparatus of claim **33** wherein said processor circuit is configured to insert said PPE portion into an unused portion of said path overhead portion.
- 20 **36.** The apparatus of claim **33** wherein said processor circuit is configured to insert said PPE portion into at least one of a **Z3** and a **Z4** byte of a Synchronous Optical NETwork (SONET) path overhead portion.
- 25 **37.** The apparatus of claim **31** wherein said processor circuit is configured to insert said PTOH portion into a transport overhead portion of said communication signal.
- 30 **38.** The apparatus of claim **37** wherein said processor circuit is configured to insert said PTOH portion into an unused portion of said transport overhead portion.
- 35 **39.** The apparatus of claim **37** wherein said processor circuit is configured to insert said PTOH portion into an unused time-slot of said transport overhead portion.
- 40 **40.** The apparatus of claim **31** wherein said processor circuit is configured to calculate said PTOH portion in response to said transport overhead contents of said communication signal prior to arrival at said network element.

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41. The apparatus of claim 40 wherein said processor circuit is configured to count a number of transport parity errors present in said communication signal prior to arrival at said network element.
42. The apparatus of claim 41 wherein said processor circuit is configured to set said PTOH portion equal to said counted number of transport parity errors present in said communication signal prior to arrival at said network element.
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43. The apparatus of claim 41 wherein said processor circuit is configured to set said PTOH portion equal to an index value indicative of said counted number of transport parity errors present in said communication signal prior to arrival at said network element.
44. The apparatus of claim 31 wherein said processor circuit is configured to insert a PTOH header value in said communication signal preceding said PTOH portion, to identify said PTOH portion.
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45. A system comprising the apparatus of claim 31 and further comprising said remote device, said remote device comprising:
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- a) a receiver operable to receive said communication signal comprising said PTOH portion and said PPE portion; and
- b) a processor circuit in communication with said receiver and configured to modify a transport overhead portion of said communication signal in response to said PTOH and PPE portions.
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46. An apparatus for providing clear channel access on a network, the apparatus comprising:
- a) means for inserting into a communication signal received at a network element, a previous transport overhead (PTOH) portion indicative of transport overhead contents of said communication signal prior to arrival at said network element, and a previous

path error (PPE) portion indicative of path errors present in said communication signal at said network element; and

- b) means for transmitting said communication signal to a remote device.

5 **47.** A computer-readable medium for providing codes for directing a processor circuit to:

- a) insert into a communication signal received at a network element, a previous transport overhead (PTOH) portion indicative of transport overhead contents of said communication signal prior to arrival at said network element, and a previous path error (PPE) portion indicative of path errors present in said communication signal at said network element; and

- b) transmit said communication signal to a remote device.

10 **48.** A signal embodied in a carrier wave, the signal comprising code segments for directing a processor circuit to:

- a) insert into a communication signal received at a network element, a previous transport overhead (PTOH) portion indicative of transport overhead contents of said communication signal prior to arrival at said network element, and a previous path error (PPE) portion indicative of path errors present in said communication signal at said network element; and

- b) transmit said communication signal to a remote device.